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COUNTRY USSR

SUBJECT A Summary of the Type and Quality of Soviet
 Research in Soil Conditioners and Fertilizers

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25X1X The following are comments on translations of the following Soviet publi-
 cations:

- (a) D M Guseinov - Primenenie Obrabotannogo Gumbrina v Tseliakh Povysheniia Urozhainosti Sel'skokhoziaistvennykh Kul'tur (Utilization of Waste Gumbrin for the Purpose of Increasing Productivity of Agricultural Crops), appearing in Prochvovedenie 1950: 735-745, December 1950 57.8 p34
- (b) R K Guseinov - Effektivnost' Granulirovannykh Udobrenii s Primeneniem Gumbrina (Effectiveness of Granulated Fertilizers with Gumbrin - Experiments with Corn), appearing in Sovet Agron 9(12):76-80, 20 So84, December 1951
- (c) P Ia Tkachev - Vliianie Organo-Mineral'nykh Granulirovannykh Udobrenii na Urozhai Podsolnechnika (Effect of Organic-Mineral Granulated Fertilizers on Yields of Sunflower), appearing in Sovet Agron 10(2):87-90, 20 So84, February 1952
- (d) A Prugalov - Novye Preparaty dlia Udalenia List'ev Khlopchatnika (New Compounds - Calcium Cyanamide - for Defoliating Cotton Plants), appearing in Khlopkovodstvo 7:42-47, July 1952 72.8 K522

1. In a recent summary of 17 Soviet articles on soil microbiology it seemed characteristic of Soviet research that everything attempted proves to be effective, and that everything the Soviets try turns out to be successful. Thus, it may safely be inferred that the Soviets tend to ballyhoo results more than in the US. However, this tendency was more striking in the 17 earlier papers, and that in the above four papers under review, the claims appear to be more justified by the results accomplished and the papers themselves reflect much more thorough work.

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2. Nevertheless, the four papers cannot be considered, in the strict sense, to be very scholarly. They are reports of research in the applied, rather than the pure, sense. They seem to have been written neither for the theoretical chemists and scientists nor for the general run of Soviet farmer (most of whom, [REDACTED] cannot read or write). They appear rather to have been written for those who supervise and run the Soviet communal farms, and, [REDACTED] would be understandable by the average intelligent US farmers, especially those who have attended agriculture schools or who customarily read the farm journals.

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3. The first article deals with a substance termed Gumbrin, described as a waste product obtained when petroleum oils are purified with the use of bleaching clay, and apparently named for the village of Gumbri, near the town of Kutaisi, in the Georgian SSR, where it is obtained. [REDACTED] there is no similar material in the US, although the article fails to give the formula or chemical composition of Gumbrin, nor does it indicate that this composition might vary with a variation in clays.

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[REDACTED] specialists in petroleum chemistry. None of them had ever heard of Gumbrin, or any similar product; and apparently there is no indication that, in the US, there are any soil conditioners made from petroleum products, or that clay is used to purify petroleum. However, it might be both profitable and rewarding to ascertain whether this method of purifying petroleum as described by the Soviets is in fact used in the US; and if so, what the composition and physical condition of the waste material are, and what is done with it; inasmuch as soil conditioners in the US are still too expensive to be used except on a small garden scale, since the cost runs approximately US\$200 per acre.

4. Be that as it may, the Soviet study shows that Gumbrin improves the physical properties of heavy soils, decreases evaporation of moisture from the soil, prevents formation of a crust on the soil surface, raises the temperature of the soil, improves the nutritive conditions of the plants, and increases emergence of cotton plants and other crops.

5. The Soviet results are convincing, and apparently all stem from the fact that Gumbrin markedly improves the physical condition of the soil, and especially the physical properties of the heavy soils, by granulation. Fundamentally then, its action and function appear to be similar to those of our soil conditioners here in the US, such as Krillium and the other organic synthetic resins.

6. The second article discusses the relative merits of granulated fertilizers prepared from waste Gumbrin combined with superphosphates, sheep manure with superphosphates, Gumbrin with ammonium sulfate, and sheep manure with ammonium sulfate. Proportions were 200 grams of Gumbrin or sheep manure to 800 grams of dry superphosphate or ammonium sulfate, or a ratio of one to four. It was found that mixtures containing Gumbrin were much superior to those containing sheep manure, and that Gumbrin with either superphosphate or ammonium sulfate made a better fertilizer than either superphosphate or ammonium sulfate alone.

7. No explanation is given in the article, but the reason is obvious if Gumbrin is actually a superior soil conditioner. Likewise, no mention is made of any chemical addition to, or change in, the plant resulting from the use of Gumbrin; but there is an implied suggestion that Gumbrin increases the efficiency with which plants can obtain added phosphate and nitrogen from both the fertilizer and the natural soil itself. The effects on corn, beets, cabbage, and onions were noted, but there was no suggestion that use was restricted to these.

8. There is nothing really new in the third article, as this sort of thing was done 150 years ago. It describes the preparation of organic-mineral granulated fertilizers by combining a "compost" (the materials of which were not given) with superphosphate and/or ammonium sulfate. Granulation was accomplished by employing liquid cow manure (probably urine) for moisture. It was found that the organic-mineral material combined with phosphorus and nitrogen is superior to either of the latter two alone.

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9. Effects are part chemical and part soil conditioning. Any organic material is a soil conditioner. Decomposable compounds in fresh manure release energy in the form of heat and hence burn plants. Thus, a compost, or old manure, is superior as the decomposable compounds have already released the energy in the form of heat, and there is a much lesser tendency to burn plants. Organic material brings about granulation by aggregating the mineral particles, and soil conditioners stabilize soil conditions existing when applied.
10. The only thing new in the fourth article is the mixture of calcium cyanamide (CaCN_2) with sodium fluosilicate (Na_2SiF) for a more efficient defoliation of cotton plants. [REDACTED] do not find that Na_2SiF has ever been used in the US for defoliating cotton. Only CaCN_2 is customarily employed in the US, but here again a check of the industry might be both profitable and rewarding, inasmuch as the Soviets report that defoliation is more effective with the added Na_2SiF , because the presence and action of the sodium increases the penetration of the CaCN_2 into the cotton leaves much more rapidly, and causes a quicker complete defoliation, resulting in a more costaneous maturing of all the bolls.
11. The Soviets report that application of the mixture of calcium cyanamide and sodium fluosilicate to cotton leaves is done through dusting or through combined treatment of a solution of calcium cyanamide through spraying. They found that the best ratio of CaCN_2 to Na_2SiF was 3:2, used as a dust, but that the two chemicals used in solution were most effective, although agitation in the sprayer was required to prevent a precipitate from settling. The calcium cyanamide is mixed with the sodium fluosilicate in the proportion of 60 kg to 40 kg, and sifted through a screen with a mesh of one mm diameter. The calcium cyanamide solution is prepared in the proportion of 10 kg CaCN_2 to 100 liters of water, and this 10% concentration diluted with five parts of water down to a 2% concentration before using.

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